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Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

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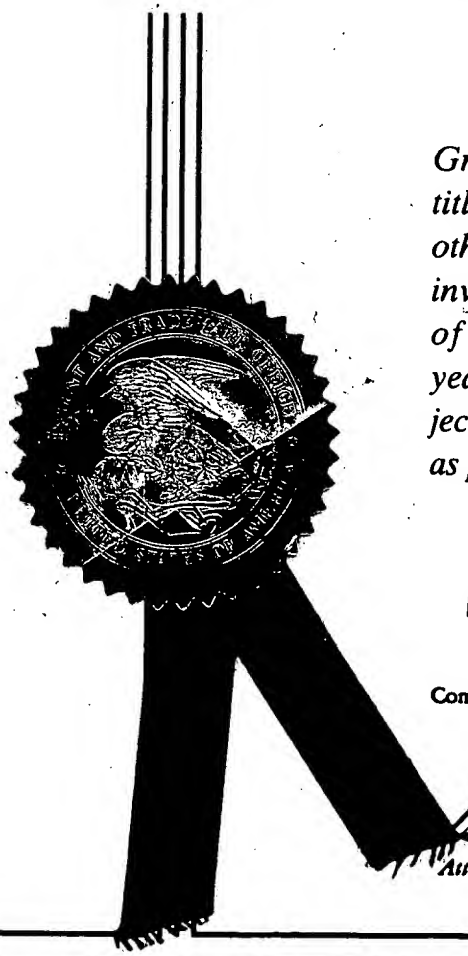

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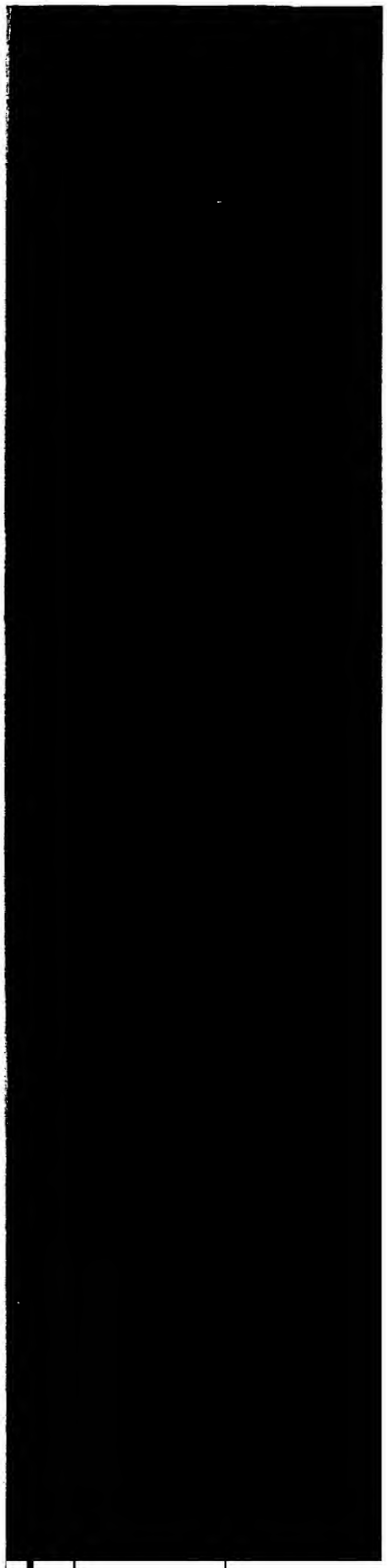

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US005510982A

United States Patent [19]

Ohnishi et al.

[11] Patent Number: 5,510,982

[45] Date of Patent: Apr. 23, 1996

[54] **AUTOMATIC AUTOMOBILE TRANSMISSION WITH VARIABLE SHIFT PATTERN CONTROLLED IN RESPONSE TO ESTIMATED RUNNING LOAD**

[75] Inventors: **Hiroshi Ohnishi**, Katsuta; **Kouji Kitano**, Kagawa; **Mitsuo Kayano**, Hitachi; **Nobuo Kurihara**, Hitachiota, all of Japan

[73] Assignee: **Hitachi, Ltd.**, Japan

[21] Appl. No.: **985,199**

[22] Filed: **Dec. 3, 1992**

[30] **Foreign Application Priority Data**

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[51] **Int. Cl.**[6] **B60K 17/06**

[52] **U.S. Cl.** **364/424.1**; 477/120; 477/900; 395/905

[58] **Field of Search** 364/424.1; 395/903, 395/905, 21, 23; 477/115, 120, 131, 138, 154, 155, 97, 900, 904

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,836,057	6/1989	Asayama et al.	477/120
5,035,160	7/1991	Morita	477/154
5,088,354	2/1992	Asada	475/276
5,140,870	8/1992	Asada	364/424.1
5,231,582	7/1993	Takahashi et al.	364/424.1
5,231,897	8/1993	Morita	364/424.1 X
5,267,158	11/1993	Sakaguchi et al.	364/424.1
5,292,288	3/1994	Kashiwabara et al.	477/156
5,309,790	5/1994	Tanaka	477/161
5,319,555	6/1994	Iwaki et al.	364/424.1

FOREIGN PATENT DOCUMENTS

0375155A1	6/1990	European Pat. Off. .
2852195C2	6/1980	Germany .
3341652C2	6/1985	Germany .
3539682C2	5/1986	Germany .
4010104A1	10/1990	Germany .
63-45976	9/1988	Japan .
3-117769	5/1991	Japan .
3-134363	6/1991	Japan .
91/15689A1	10/1991	WIPO .

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[57] **ABSTRACT**

An automatic transmission control system for an automobile, comprising a vehicle weight estimation unit which estimates a vehicle weight of the automobile a torque estimation unit which estimates an output torque, an acceleration input unit which accepts an acceleration signal; a load estimation unit (**110**) which estimates a running load from the estimated vehicle weight, the estimated output torque and the accepted acceleration; a memory which stores a plurality of shift schedules therein; and a gear position determination unit (**109**) which includes the memory, and which selects one of the shift schedules in accordance with the vehicle weight and the estimated running load, so as to determine a gear position of an automatic transmission of the automobile in conformity with the selected shift schedule. An exact shift operation conformed to the vehicle weight and the running load can be performed, and an enhanced fuel consumption can be attained.

7 Claims, 20 Drawing Sheets